



## Appendix C ECONOMIC BENEFIT STUDY

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**EXECUTIVE SUMMARY**

This report presents estimates of the economic benefits of Chino Airport for the economy of the airport service area, including San Bernardino County and also portions of Riverside, Orange and Los Angeles Counties.

There are 968 based aircraft on the airport, including 171 vintage aircraft, 562 single engine planes, 148 multi-engine aircraft, 36 turboprops, 28 jets and 23 rotary craft. In 2002, Chino Airport recorded over 80,000 itinerant operations, with a large proportion due to business aircraft activity.

**Measuring Economic Benefits**

An airport serves as a gateway that welcomes commerce and visitors into a region and provides access for the citizens and businesses of the region to travel outward to the economy at large.

General aviation airports provide a means for business travelers to reach destinations without the constraints of today's airline flights. Moreover, general aviation air travel provides access to more than 5,300 airports in the nation, compared to approximately 565 served by scheduled airlines.

The presence of an airport creates benefits for a community in diverse ways. Airports bring essential services, including enhanced medical care (such as air ambulance service), support for law enforcement and fire control, and courier delivery of mail and high value parcels.

These services raise the quality of life for residents and maintain a competitive environment for economic development.

Although qualitative advantages created by the presence of an airport are important, they are also difficult to measure. In studying airport benefits, regional analysts have emphasized indicators of economic activity for airports that can be quantified, such as dollar value of output, number of jobs created, and earnings of workers and proprietors of businesses.

Economic benefit studies differ from cost-benefit analyses, which are often called for to support decision-making, typically for public sector capital projects. Measurement of economic benefits is synonymous with evaluation of economic performance. The methodology was standardized in the publication by the Federal Aviation Administration, *Estimating the Regional Economic Significance of Airports*, Washington DC, 1992.

Following the FAA methodology, this study views Chino Airport as a source of measurable economic output (the production of aviation services) that creates employment and earnings for workers on and off the airport.

Business spending on the airport injects revenues into the community when firms buy products from suppliers and again when employees of the airport spend for household goods and services. In addition, spending by air visitors produces revenues for firms in the hospitality sector as well as employment and earnings for workers.

## **Benefit Measures**

The quantitative measures of economic benefits of the Chino Airport are each described below.

**Output** is the value in dollars of the production of goods and services by businesses or the budget of a government unit. Output is equivalent to revenue or spending or sales measured in dollars.

From the perspective of the business that is the supplier of goods and services, the dollar value of output is equal to the revenues received by that producer. From the viewpoint of the consumer, the dollar value of the output is equal to the amount that the consumer spent to purchase those goods and services from the business.

**Earnings** are a second benefit measure, made up of employee compensation (the dollar value of payments received by workers as wages and benefits) and proprietor's income received by those who have their own business.

**Employment** is the third benefit measure, the number of jobs supported by the revenues created by the presence of Chino Airport.

To measure the economic benefits of the airport, information on revenues, employment and earnings was obtained directly from suppliers and users of aviation services to tabulate the economic activity created by the presence of the airport. Data collection involved interviews and surveys of on-airport employers including private sector firms and government agencies and airport administrative staff.

General aviation travel patterns for arriving visitors and flights by based aircraft were

analyzed using tower and FAA data on origin and destination. Based aircraft owners were surveyed on expenditures and travel patterns.

## **Benefit Sources**

Economic benefits (output, employment and earnings) are created when economic activity takes place both on and off the airport. The economic benefits of Chino Airport for 2002 are shown in Table C1.

The total benefits of the airport, the sum of the direct benefits and the indirect benefits, which result as dollars re-circulate in the regional economy, were calculated to be:

- **\$145.5 Million Revenues**
- **\$27.9 Million Earnings**
- **657 Total Employment**

## **On-Airport Direct Benefits**

Operations on Chino Airport supported a total of 60 private and public employers including FBO services, charter, aircraft rental, aircraft sales and leasing, pilot training, avionics, maintenance, repair, storage, air taxi, government agencies such as the San Bernardino Airports Department and various non-aviation businesses.

Including the revenues and employment created by outlays for airport capital projects, these economic units were responsible for on-airport benefits of:

- **\$89.8 Million Revenues**
- **\$15.2 Million Earnings**
- **396 On-Airport Jobs**

**TABLE C1**  
**Summary of Economic Benefits – 2002**  
**Chino Airport**

	<b>BENEFIT MEASURES</b>		
<b>Source</b>	<b>Revenues</b>	<b>Earnings</b>	<b>Employment</b>
<b>On-Airport Aviation Benefits</b>	<b>\$32,000,000</b>	<b>\$10,400,000</b>	<b>266</b>
<b>On-Airport Non-Aviation Benefits</b>	<b>55,800,000</b>	<b>4,080,000</b>	<b>113</b>
<b>Capital Projects</b>	<b>2,000,000</b>	<b>720,000</b>	<b>17</b>
<b>All On-Airport Economic Benefits</b>	<b>89,800,000</b>	<b>15,200,000</b>	<b>396</b>
<b>Air Visitor Benefits</b>	<b>1,000,000</b>	<b>400,000</b>	<b>24</b>
<b>Direct Benefits: Sum of On-Airport &amp; Air Visitor Benefits</b>	<b>90,800,000</b>	<b>15,600,000</b>	<b>420</b>
<i><b>Indirect Benefits (Multiplier Effects of Secondary Spending)</b></i>	<i><b>54,700,000</b></i>	<i><b>12,300,000</b></i>	<i><b>237</b></i>
<b>TOTAL BENEFITS</b>	<b>\$145,500,000</b>	<b>\$27,900,000</b>	<b>657</b>

### **Air Visitor Direct Benefits**

An additional source of aviation-related spending comes from visitors to the area that arrive at Chino Airport. When air travelers make off-airport expenditures these outlays create revenues (sales) for firms that supply goods and services to visitors. During a typical year, there are more than 4,500 general aviation air travelers that arrive at the airport by private, corporate, or chartered aircraft.

Visitors traveling for business or personal reasons spend for lodging, food and drink, entertainment, retail goods and services, and ground transportation including auto rental and taxis, creating annual airport service area output, employment and earnings of:

- **\$1.0 Million Revenues**
- **\$0.4 Million Earnings**
- **24 Off-Airport Jobs**

### **Combined Direct Benefits**

The combined direct benefits represent the sum of on-airport and off-airport (visitor) revenues, earnings and employment due to the presence of the airport. Direct benefits are the “first round” impacts and do not include any multiplier effects of secondary spending. The direct benefits of on-airport and off-airport economic activity related to Chino Airport were:

- **\$90.8 Million Revenues**
- **\$15.6 Million Earnings**
- **420 Jobs**

Combined revenue flows for businesses and employers on and off the airport sum to a

value of \$90.8 million.

The airport presence created benefits to workers by providing income and earnings within the region of \$15.6 million, which represents the payment for the labor component of the airport economic activity.

There were 420 jobs created directly by the suppliers and users of aviation services (this figure includes non-aviation employers on the airport).

### **Indirect Benefits (Multiplier Effects)**

Indirect benefits (multiplier effects) are created when the initial spending by airport employers or visitors circulates and recycles through the economy. In contrast to initial or direct benefits, the indirect benefits measure the magnitude of successive rounds of re-spending as those who work for or sell products to airport employers or the hospitality sector spend dollars.

For example, when an aircraft mechanic’s wages are spent to purchase food, housing, clothing, and medical services, these dollars create more jobs and income in the general economy of the region through multiplier effects of re-spending.

The initial direct revenue stream in the service area of \$90.8 million created by the presence of Chino Airport was estimated to stimulate indirect benefits from multiplier effects within the airport service area of:

- **\$54.7 Million Revenues**
- **\$12.3 Million Earnings**
- **237 Jobs**

## **ON-AIRPORT BENEFITS**

This section provides more detail on the economic benefits associated with activity on site at Chino Airport.

Table C2 sets out the annualized employment, earnings and value of output (revenues) produced by airport tenants in 2002. Values shown for revenues, employment and earnings are the direct benefits and do not include multiplier effects of indirect benefits.

### **On-Airport Output**

Private sector on-airport aviation activity created annual output valued at \$28.5 million (not including capital projects). There were 43 private sector aviation employers on the airport in 2002.

Aviation businesses at Chino Airport offer full FBO services for the aviation community including aircraft rental, maintenance, avionics, aircraft fueling, and refurbishing and modification. Firms provide services to the public such as flight training for those interested in learning to fly and aircraft charter for business or personal travel.

Aviation activities on the airport include unique services for vintage aircraft, including complete restoration and flight readiness. Vintage aircraft may be viewed in on-site museums and have been used in Hollywood movie productions.

In addition, businesses can facilitate aircraft sales, leasing, exchange, and fractional ownership arrangements for various categories up to sophisticated turbine aircraft suitable for executive and business applications.

There are several government agencies supporting aviation, including the San Bernardino Airports Department, Chino Valley Fire District, and air traffic control tower staff. Government budgets exceeded \$3.4 million.

Chino Airport has also attracted several non-aviation employers. The airport is a locus for important non-aviation businesses that primarily support the local dairy and agricultural industries that serve the growing population of the San Bernardino County area. In 2002 there were 14 non-aviation firms and agencies on the airport, with \$55.8 million in output (revenues).

### **Capital Projects**

Capital projects are vital for airports to maintain safety and provide for growth. Capital spending for airport improvements also creates jobs and injects dollars into the local economy. Spending for improvements during 2002 was \$2,000,000.

### **Employment and Earnings**

Surveys and interviews with on-airport employers provided a tally of 266 aviation jobs on the airport. Aviation employees brought home annual earnings of \$10.4 million. With the inclusion of 17 capital project workers and 113 non-aviation employees, the employment on the airport was calculated as 396 workers in 2002, with earnings of \$15.2 million.

### **Summary of On-Airport Benefits**

On-airport activity created \$89.8 million in value of output. This activity supported employment of 396 workers on the airport, with 59% of these jobs in the private sector.

**TABLE C2**  
**On-Airport Benefits: Revenues, Earnings and Employment**  
**Chino Airport**

	<b>BENEFIT MEASURES</b>		
<b>Sources of On-Airport Benefits</b>	<b>Revenues</b>	<b>Earnings</b>	<b>Employment</b>
<b>Aviation Firms</b> <b>FBO Services &amp; Fueling</b> <b>Avionics &amp; Maintenance</b> <b>Aircraft Sales &amp; Leasing</b> <b>Aircraft Charter/Air Taxi/Rental</b> <b>Aircraft Storage</b> <b>Pilot Training &amp; Supplies</b> <b>Aviation Museums</b> <b>Vintage Aircraft Restoration</b>	<b>\$28,552,000</b>	<b>\$8,480,000</b>	<b>235</b>
<b>Capital Projects</b>	<b>2,000,000</b>	<b>720,000</b>	<b>17</b>
<b>Government Agencies/Services</b> <b>San Bernardino County</b> <b>Chino Valley Fire District</b> <b>Air Traffic Control Tower</b>	<b>3,448,000</b>	<b>1,920,000</b>	<b>31</b>
<b>Aviation-Related Benefits</b>	<b>\$34,000,000</b>	<b>\$11,120,000</b>	<b>283</b>
<b>Non-Aviation Firms &amp; Agencies</b>	<b>55,800,000</b>	<b>4,080,000</b>	<b>113</b>
<b>ON-AIRPORT BENEFITS</b>	<b>\$89,800,000</b>	<b>\$15,200,000</b>	<b>396</b>
<b>Source: Survey of Employers, Chino Airport</b>			

## AIR VISITOR BENEFITS

Chino Airport attracts general aviation visitors from throughout the region and the nation who come to the area for business, recreational and personal travel. This section provides detail on economic benefits from general aviation air travelers who use the airport. Values shown for spending (revenues), employment and earnings are direct benefits of initial visitor outlays and do not include multiplier effects of indirect benefits.

**TABLE C3**  
**GA Aircraft Origination**  
**Chino Airport**

Rank and Origin	State
1. John Wayne Airport	CA
2. Long Beach/Daugherty	CA
3. Fullerton Municipal	CA
4. Van Nuys	CA
5. McClellan - Palomar	CA
6. McCarran International	NV
7. Montgomery Field	CA
8. Santa Monica Municipal	CA
9. Zamperini Field	CA
10. Hawthorne Municipal	CA
11. Camarillo	CA
12. Santa Barbara Municipal	CA
13. Brown Field Municipal	CA
14. Oxnard	CA
15. French Valley	CA

Source: FAA Flight Plan Data Base and  
Chino Airport

In order to analyze general aviation traffic patterns at the airport, a database of 1,500 general aviation flight plans involving Chino Airport as either destination or origin for travel was obtained from the FAA.

In this sample for the spring of 2002, the most frequent source of itinerant flights arriving at Chino Airport was John Wayne Airport. Second in importance was Long Beach/Daugherty Field, followed by Fullerton Municipal, Van Nuys, and McClellan-Palomar rounding out the top five (Table C3).

Overall, general aviation aircraft arriving at CNO during the study period originated at more than 120 airports around the nation, with several from outside the U.S.

Past years have seen as many as 100,000 itinerant general aviation operations annually at Chino Airport. Operations involve both arrivals and departures. It is necessary to differentiate between itinerant operations by based and transient aircraft.

An itinerant operation typically involves an origination or destination airport other than Chino Airport. However, both based and non-based aircraft contribute to itinerant activity in any given day. When a based aircraft returns to Chino Airport from Burbank, for example, that is an itinerant operation. When an aircraft based at an airport other than Chino arrives at Chino Airport that aircraft is classified as a transient.

There were 40,458 itinerant aircraft arrivals reported at Chino Airport in 2002. Of these, there were 4,161 transient aircraft arriving at Chino Airport as visitors, on flights originating at their base airport in California or throughout the nation.



The arriving aircraft were divided between 890 that brought overnight visitors and 3,271 that were at the airport one day or less (Table C4).

To ensure a conservative estimate of spending by one-day visitors, one-day aircraft were separated into those staying less than 4 hours and 4 hours or more. Those who stayed less than 4 hours were excluded from the study.

Visitor spending estimates computed for those aircraft staying 4 hours or longer at Chino Airport reflect the fact that many aircraft stop only for fuel or for some other short term purpose and travelers do not spend for food, retail shopping, or ground transportation off the airport.

**TABLE C4  
GA Transient Aircraft  
Chino Airport**

Item	Annual Value
Itinerant AC Arrivals	40,458
Transient AC Arrivals	4,161
Overnight Transient AC	890
One Day Transient AC	3,271
Source: Derived from FAA Flight Plan Data Base and Chino Airport Records, 2002	

Conversely, those travel parties who stayed more than 4 hours were viewed as potentially spending both on and off the airport. There were 1,330 general aviation aircraft that stayed on the ground 4 hours or more during the year.

Separate analyses were conducted for those GA visitors with an overnight stay and those whose visit was one day or less in duration.

### **Overnight GA Visitors**

Information on visiting general aviation aircraft was derived from flight plan and tower records on types of aircraft, based airport, arrivals, departures, and length of stay at Chino Airport. Travel party information on spending for lodging, food, retail goods and services and ground transportation was based on figures compiled especially for this study by Runzheimer International, a private travel services firm, utilizing proprietary data for San Bernardino County.

**TABLE C5  
GA Overnight Visitors  
Chino Airport**

Item	Annual Value
Transient AC Arrivals	4,161
Overnight Transient AC	890
Avg. Party Size	1.8
Number of Visitors	1,602
Average Stay (nights)	3.4
Visitor Days	5,447
Spending per Aircraft	\$1,033
Total Expenditures	\$919,370
Source: Derived from FAA Flight Plan Data Base, Chino Airport Records & Runzheimer International, 2002	

The travel patterns underlying the calculation of overnight GA visitor economic benefits are shown in Table C5. There were a reported 890 transient overnight aircraft. The average party size was 1.8 persons and the average overnight travel party stayed in the Chino area for 3.4 days.

There were 1,602 overnight visitors for the year, with a combined total of 5,447 visitor days. Spending per travel party per aircraft averaged \$1,033. Total spending by all GA overnight visitors summed to \$919,370 for the year.

**TABLE C6  
Overnight GA Aircraft Spending  
Chino Airport**

Category	Spending	Percent
Lodging	\$378	36
Food/Drink	398	39
Retail	79	8
Entertainment	60	6
Transportation	118	11
<b>TOTAL</b>	<b>\$1,033</b>	<b>100</b>
<b>Source: FAA Flight Plan Data Base and Runzheimer International, 2002</b>		

Table C6 shows the percentage distribution of outlays by overnight travel parties at Chino Airport. Food and drink spending accounted for 39 percent of visitor spending, averaging \$398 per aircraft travel party. Lodging

spending was second in importance at \$378 per aircraft.

### **Day GA Visitors**

According to flight operations records, 79 percent of transient general aviation aircraft arriving at Chino Airport were visitors that stayed on the airport for one day or less.

During the year, there were 3,271 aircraft that stopped at the airport for one day. Some were only on the ground for a few minutes while others were parked several hours when the travel party had their aircraft serviced, pursued a personal activity or conducted business.

The economic benefits from arriving aircraft travel parties are of two types. Those pilots or aircraft owners that buy fuel or have their aircraft serviced on the airport are making purchases which contribute to the revenue stream received by aviation businesses on the airport. That type of spending creates output, employment, and earning on the airport. Those economic benefits are shown above in Table C2 as on-airport benefits.

However, if the aircraft travel party leaves the airport to visit a corporate site, conduct a business meeting, or attend a sporting or cultural event, these off-airport activities may generate new spending that creates jobs and earnings in the local community. For the purposes of this study, those travel parties that arrived and departed within four hours were assumed to have not left the airport and not contributed any significant spending off the airport.

Of the 4,161 transient aircraft that stopped at Chino Airport during the study year, there were 1,330 that were parked for more than four hours but not overnight (Table C7).

**TABLE C7**  
**General Aviation Day Visitors**  
**Chino Airport**

Item	Annual Value
Transient AC Arrivals	4,161
One Day Transient AC	3,271
Stay >= 4 Hours	1,330
Average Stay (Hours)	4.3
Avg. Party Size	1.8
Number of GA Visitors	2,394
Spending per Aircraft	\$97
Total Expenditures	\$129,000
Source: Source: Derived from FAA Flight Plan Data Base, Chino Airport Records & Runzheimer values	

The average stay in the area for those travel parties was 4.3 hours, according to arrival and departure records, with a range of 4 to 12 hours.

Day trip aircraft brought 2,394 visitors to the Chino area during the year. The average spending per one-day aircraft was reported on visitor surveys as \$97. The total economic benefits created by off-airport spending by one-day general aviation visitors tallied to \$129,000 of output (revenues or sales off the airport).

The largest expenditure category for one-day visiting travel parties was food and drink, which averaged \$59 per aircraft travel party for the day and accounted for 61 percent of outlays (Table C8). Spending for ground

transportation was the second largest category, at \$17 per aircraft.

**TABLE C8**  
**Day Visitor Aircraft Spending**  
**Chino Airport**

Category	Spending	Percent
Lodging	\$ 0	
Food/Drink	59	61
Retail	12	12
Entertainment	9	9
Transportation	17	18
TOTAL	\$97	100
Source: FAA Flight Plan Data Base and Runzheimer International, 2002		

### Combined GA Visitor Spending

Table C9 shows the economic benefits resulting from spending in the region by combined overnight and day general aviation visitors arriving at Chino Airport. To recap, there were 4,161 transient general aviation aircraft that brought visitors to the airport during the year. Of these, 890 were arriving overnight general aviation aircraft and 1,330 were one day visiting aircraft that were parked more than 4 hours, long enough to make off-airport expenditures.

Each overnight travel party spent an average of \$1,033 during their trip to the airport service area and travelers on each day visitor aircraft spent an estimated \$97 per trip.

Multiplying the expenditures for each category of spending by the number of aircraft yields the total outlays of \$1.0 million.

There were 9,017 visitor days attributable to general aviation travelers during the year. Seventy percent of visitor days (6,264) were due to overnight GA travelers and thirty percent (2,394) were from one-day visitors.

The largest spending category by general aviation visitors was expenditures for food and drink, with outlays of \$432,690, or 41 percent of the total. Spending for lodging accounted for 32 percent and was the second largest category, with outlays of \$336,420 for

the year. Taken together, these two categories accounted for 73 percent of the economic benefits from GA visitors to Chino Airport.

Of total spending of \$1.0 million created by GA visitors, an average of 40 cents of each dollar was used within the service area by employers as earnings paid out to workers. Wages taken home by tourism/visitor sector workers for spending in their own community summed to \$400,000 during the year.

Earnings in the lodging industry accounted for nearly 35 percent of total earnings created from visitor spending.

**TABLE C9**  
**Economic Benefits from GA Visitors - Revenues, Earnings and Employment**  
**Chino Airport**

Category	Spending per AC		Revenues	Earnings	Employment
	Overnight	Day			
Lodging	\$378		\$336,420	\$136,894	7
Food/Drink	398	\$59	432,690	167,397	12
Retail Sales	79	12	86,270	43,610	2
Entertainment	60	9	65,370	14,637	1
Ground Transport	118	17	127,630	37,462	2
<b>TOTAL</b>	<b>\$1,033</b>	<b>\$97</b>	<b>\$1,048,380</b>	<b>\$400,000</b>	<b>24</b>

**Note:** Earnings and employment figures were derived from the Implan input-output model based on data for Chino Airport service area from the California Department of Employment Development and the United States Bureau of Economic Analysis. Employment is not necessarily full time equivalents; includes full and some part time workers, figures rounded to head counts.

## INDIRECT BENEFITS: MULTIPLIER EFFECTS

The output, employment, and earnings from on-airport activity and off-airport visitor spending represent the computed direct benefits from the presence of Chino Airport. For the service area, these direct benefits summed to \$90.8 million of output (measured as revenues to firms and budgets of administrative units), 420 jobs, and earnings to workers and proprietors of \$15.6 million. These figures for initial economic activity created by the presence of the airport do not include the “multiplier effects” that result from additional spending induced in the economy to produce the initial goods and services.

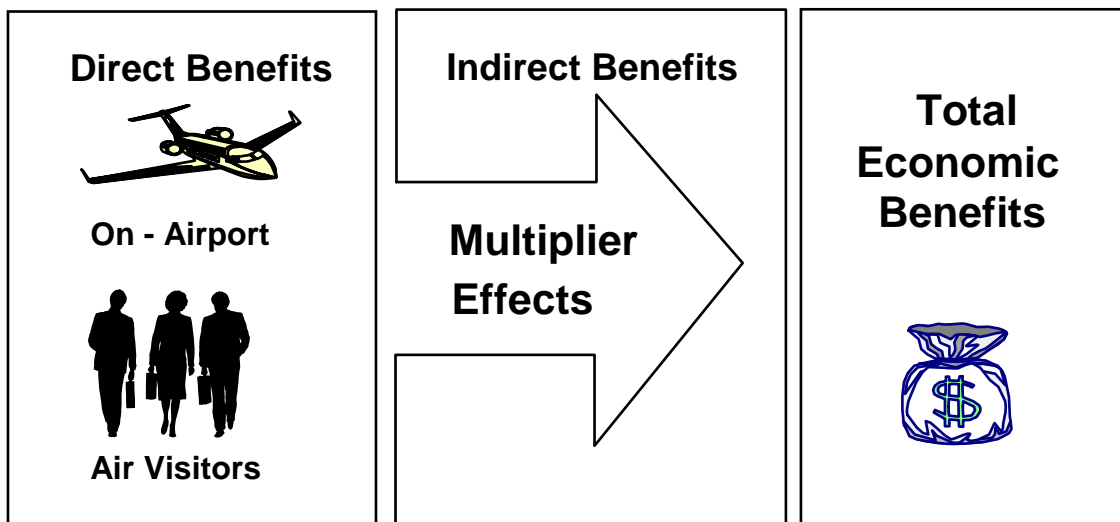
Production of aviation output requires inputs in the form of supplies and labor. Purchase of

inputs by aviation firms has the effect of creating secondary or indirect revenues, employment, and earnings due to the presence of the airport that should be included in total benefits of the airport. Airport benefit studies rely on multiplier factors from input-output models to estimate the impact of secondary spending on output, earnings and employment to determine indirect and total benefits, as illustrated in the figure below.

The multipliers used for this study were from an input-output model for San Bernardino County based on statistically weighted industry output, input and employment data. To demonstrate the methodology of the approach, average Chino Airport service area multipliers for revenues (output), earnings and employment are shown in Table C10.

The multipliers represent weighted averages for combined industries in each category. For example, the visitor benefits multipliers

## The Multiplier Process Chino Airport



shown combine lodging, food services, retailing, auto rental and entertainment multipliers used in the analysis.

The multipliers in this table illustrate the process for calculating the indirect and total impacts on all industries of the regional economy resulting from the direct impact of each individual aviation related industry.

The multipliers for output show the average dollar change in revenues for all firms in the service area due to a one-dollar increase in revenues either on the airport or through visitor spending.

For example, each dollar of new output (revenue) created by on-airport employers circulates through the economy until it has stimulated total output in all industries in the service area of \$1.6023.

Or, put differently, the revenue multiplier of 1.6023 for on-airport activity shows that for each dollar spent on the airport there is additional spending created of \$0.6023 or 60.23 cents of indirect or multiplier spending.

Direct revenues from all sources associated with the presence of Chino Airport were \$90.8 million for the year. After accounting for the multiplier effect, total revenues created within the service area were \$145.5 million. Indirect or secondary revenues were \$54.7 million, the difference between total and direct revenues.

The multiplier for earnings shows the dollar change in earnings for the service area economy due to a one-dollar increase in earnings either on the airport or in the visitor sector. The earnings multipliers determine how wages paid to workers on or off the airport stay within the economy and create additional spending and earnings for workers in secondary industries. For example, each

dollar of wages paid for workers on the airport stimulates an additional \$0.7895 of earnings in the total economy.

The initial direct wages of \$15.2 million for aviation workers and proprietors on the airport were spent for consumer goods and services that in turn created additional earnings of \$12.0 million for workers and proprietors in the general economy.

The total earnings benefit of the airport was \$27.9 million, consisting of \$15.6 million of direct benefits and \$12.3 million of indirect benefits. The economic interpretation is that the presence of the airport provided employment and earnings for workers, who then re-spent these dollars in the service area.

The multipliers for employment show the total change in jobs for the service area economy due to an increase of one job on or off the airport. Each job on the airport is associated with 0.578 additional jobs in the rest of the airport service area economy. Similarly, each job in the hospitality industry supported by air visitor spending is associated with 0.3333 additional jobs in the general economy.

The overall result is that the 420 direct jobs created by the airport supported an additional 237 jobs in the service area as indirect employment. The sum of the direct aviation related jobs and indirect jobs created in the general economy is the total employment of 657 workers that can be attributed to the presence of the airport.

The information above is intended for illustration only. In the full analysis separate multipliers were used for on-airport aviation and non-aviation employers and visitor spending categories (lodging, eating places, retail, entertainment, and ground transportation).

**TABLE C10****Average Multipliers and Indirect Benefits Within the Airport Service Area  
Chino Airport**

<b>Revenue Source</b>	<b>Direct Revenues</b>	<b>Average Output Multipliers</b>	<b>Indirect Revenues</b>	<b>Total Revenues</b>
<b>On-Airport Benefits</b>	<b>\$89,800,000</b>	<b>1.6023</b>	<b>\$54,100,000</b>	<b>\$143,900,000</b>
<b>Visitor Benefits</b>	<b>1,000,000</b>	<b>1.6000</b>	<b>600,000</b>	<b>1,600,000</b>
<i>Revenues</i>	<i>\$90,800,000</i>		<i>\$54,700,000</i>	<i>\$145,500,000</i>
<b>Earnings Source</b>	<b>Direct Earnings</b>	<b>Average Earnings Multipliers</b>	<b>Indirect Earnings</b>	<b>Total Earnings</b>
<b>On-Airport Benefits</b>	<b>\$15,200,000</b>	<b>1.7895</b>	<b>\$12,000,000</b>	<b>\$27,200,000</b>
<b>Visitor Benefits</b>	<b>400,000</b>	<b>1.7500</b>	<b>300,000</b>	<b>700,000</b>
<i>Earnings</i>	<i>\$15,600,000</i>		<i>\$12,300,000</i>	<i>\$27,900,000</i>
<b>Employment Source</b>	<b>Direct Employment</b>	<b>Average Employment Multipliers</b>	<b>Indirect Employment</b>	<b>Total Employment</b>
<b>On-Airport Benefits</b>	<b>396</b>	<b>1.5783</b>	<b>229</b>	<b>625</b>
<b>Visitor Benefits</b>	<b>24</b>	<b>1.3333</b>	<b>8</b>	<b>32</b>
<i>Employment</i>	<i>420</i>		<i>237</i>	<i>657</i>

**Notes:** Multipliers above are weighted averages intended to illustrate how indirect and total benefits were calculated for Chino Airport. In the full analysis, separate multipliers were used for on-airport employers (FBO, other aviation businesses, non-aviation), and visitor spending (lodging, eating places, retailing, entertainment, and ground transportation). Multipliers were for San Bernardino County as produced by the Implan input-output model based on data from the California Department of Employment Development and U. S. Bureau of Economic Analysis.

## BASED AIRCRAFT BENEFITS

A survey of owners of aircraft based at Chino Airport was conducted to compile information on private aircraft usage patterns, including number of trips per year, purpose of travel, average party size, and average hours flown per trip. Questions were also posed concerning the importance of the airport for residential location and businesses of flyers.

There were 968 based-aircraft at Chino Airport in 2002 (Table C11). Of these, 36 were turboprop aircraft and 28 were business jets.

**TABLE C11**  
**Based Aircraft Profile**  
**Chino Airport**

Type	Number
<b>Total Based Aircraft</b>	<b>968</b>
<b>Single Engine Piston</b>	<b>562</b>
<b>Multi-Engine Piston</b>	<b>148</b>
<b>Turboprop</b>	<b>36</b>
<b>Jet</b>	<b>28</b>
<b>Vintage</b>	<b>171</b>
<b>Helicopter</b>	<b>3</b>
<b>Source: Chino Airport</b>	

The presence of the airport as a factor affecting the personal quality of life and business success of aircraft owners was

measured by survey questions asking respondents to rate the airport as “very important, important, slightly important, or not important” to their residential location decision and their business.

The survey results show that Chino Airport is a significant factor in influencing the success of business and professional activity of aircraft owners.

- Four out of ten of all responding based aircraft owners (40 percent) said that the airport is “very important” or “important” to the success of their business location.
- Further, seven out of ten aircraft owners (70%) stated that the airport is “very important” or “important” to their residential location decision.

Those who reported the airport as important to their business were also asked for information about their business.

- Firms represented by users of based aircraft for business purposes accounted for 11,000 employees in the service area, and the businesses of the combined respondents accounted for more than \$3.2 billion of annual sales.

Drawing from these results, it is evident that Chino Airport plays a key role in the overall quality of life and level of economic activity in the Chino metropolitan area, and particularly supports the business community.

Characteristics of based aircraft at Chino Airport are set out in Table C12. The average value reported by owners of based aircraft was \$97,000 and annual outlays for maintenance and related upkeep expenses were \$10,000.



**TABLE C12**  
**Based Aircraft Characteristics**  
**Chino Airport**

Category	All Chino Based AC
Average AC Value	\$97,000
Maintenance/Yr	\$10,000
Total Personal Hours/Yr – 794 Based AC	50,022
Total Business Hours/Yr – 794 Based AC	14,292
Total GA Hours Flown/Yr – 794 Based AC	64,314
Total Passenger Hours Flown/Yr – 794 Based AC	120,768
<p><b>Note: Figures above do not include vintage aircraft and rotary craft.</b>  <b>Source: Derived from Based Aircraft Owner Survey</b></p>	

Combined based aircraft flew a total of 50,022 hours for personal use and 14,292 hours for business use during the year. Total non-training hours flown were 64,314 (the table does not include figures for vintage aircraft and rotary craft).

Based aircraft owners at Chino Airport reported an average of 81 non-training hours per year (Table C13), or approximately 1.5 hours per week. The range of annual hours reported by aircraft owners included use of one plane for up to 200 hours per year.

The average hours of personal use for based aircraft from the survey was reported to be 63 hours per year. The average hours of business use was reported as 18 hours of travel for business purposes per year, or 1.5 hours per

month. Of all owners, 42 percent reported some business use for their aircraft.

Multiplying average personal hours of 63 per year by 794 (non-vintage) aircraft yields 50,022 hours of personal travel for combined based aircraft (Table C14).

On personal trips, the average was 1.9 persons in the travel party. There were an estimated 95,042 passenger hours flown for personal reasons that originated at Chino Airport during the year.

The average hours of business use for a general aviation aircraft was 18 hours per year (Table C15).

**TABLE C13**  
**Based Aircraft Use Patterns**  
**Chino Airport**

Type	Annual Hours
Avg. Number of Hours	81
Avg. Personal Hours	63
Avg. Business Hours	18
Percent Personal Hours	78%
Percent Business Hours	22%
Source: Based Aircraft Owner Survey	

Multiplying 18 hours per year by 794 aircraft yields an estimated 14,292 business hours flown by all combined based aircraft at Chino Airport.

**TABLE C14**  
**Based Aircraft - Personal Use**  
**Chino Airport**

Item	Annual Value
Avg. Personal Hours/AC	63
Avg. Party Size	1.9
AC Personal Hours	50,022
Passenger Hours	95,042
Source: Based Aircraft Owner Survey	

On business trips, the average was 1.8 persons in the travel party. There were an estimated 25,726 passenger hours flown for business reasons that originated at Chino Airport during the year.

**TABLE C15**  
**Based Aircraft - Business Use**  
**Chino Airport**

Item	Annual Value
Avg. Business Hours/AC	18
Avg. Party Size	1.8
AC Business Hours	14,292
Passenger Hours	25,726
Source: Based Aircraft Owner Survey	

An estimate of the dollar value of travel on based aircraft may be obtained by computing the cost of making these same trips on a chartered flight.

Although it is widely recognized that general aviation returns significant social and economic benefits, analysts typically measure the dollar value of a particular trip using procedures recommended by the U. S. Internal Revenue Service. Options acceptable to the IRS include applying a mileage rate (the Standard Industry Fare Level), assigning direct aircraft operating costs to the trip, or valuation based on the costs of a charter flight to travel the same distance.

The weighted average round trip hours for combined personal and business trips from the survey was 5.6 hours. One-way hours were 2.8. The cost of charter flights varies by the

**TABLE C16**  
**Charter Equivalent Value of General Aviation Travel**  
**Chino Airport**

Aircraft Type	Number	Weights	Hourly Charter Cost	Weighted Cost
Single Engine	562	0.71	\$492	\$349
Twin Engine	148	0.20	548	110
Turboprop	36	0.05	1,539	77
Jet	28	0.04	6,893	276
<b>TOTAL</b>	<b>794</b>			<b>\$811</b>
<b>Note: Mid-range charter cost by aircraft type for 1 hour round trip, various charter services, summer 2002. Does not include standby time, landing fees, other charges. Distance range 600-700 miles.</b>				
<b>Charter Equivalent Value Based On Above Cost Per Flight</b>				
	Hours	Hourly Cost	Total Value	
	54,314	\$811	\$44,049,000	

distance and type of aircraft. Table C16 shows charter rates for round trips of one hour from Chino Airport at mid-year 2002. A weighted average charter cost was determined by assigning a cost equivalent to the number of each aircraft type based at the airport. For example, since 71% of the aircraft are single engine, the cost of a single engine charter had a weight of .71 in the overall charter cost.

Excluding helicopters and vintage aircraft, the 794 based-aircraft flew a total of 54,314 total non-training hours during the year. Assigning an average charter value of \$811 per hour, the “charter equivalent value” of general aviation

travel originating at Chino Airport for the year totaled \$44.0 million.

This \$44.0 million charter equivalent value of travel figure, while very large, does not accurately measure all the associated economic gains and benefits such as those from business trips, which may be substantial. A single air trip can result in additional profits, fees, or revenues to a business firm. Further, the flexibility compared to scheduled airline travel and the time saved by general aviation travel compared to automobile use is not calculated here, but certainly has economic significance.

## **SUMMARY & FUTURE BENEFITS**

Airports are available to serve the flying public and support the regional economy every day of the year. On a typical day at Chino Airport, there are nearly 400 operations by aircraft involved in local or itinerant activity including flight training, charter service, corporate travel, or aircraft bringing passengers visiting the area for personal travel or on business.

During each day of the year, Chino Airport generates \$400,000 of revenues within its service area (see box). Revenues and production support jobs, not only for the suppliers and users of aviation services, but throughout the economy. These revenues also include non-aviation related activities as well as capital projects.

Each day Chino Airport provides 396 jobs directly on the airport and in total supports 657 local jobs in the airport service area, also including non-aviation and capital project activities. These workers bring home daily earnings of \$76,400 for spending in their home communities.

On an average day during the year, there are 25 visitors in the area who arrived at Chino Airport. Some will stay in the Chino area for only a few hours while they conduct their business, and others will stay overnight. The average spending by these visitors on a typical day injects \$2,700 into the local economy. Table C17 shows a summary of current economic benefits associated with “aviation only” activities on or around the airport. Direct benefits to the service area, without including multiplier effects, include revenues of \$33 million, 290 jobs and earnings to workers and proprietors of \$10.8 million.

### **Chino Airport Daily Economic Benefits\***

- **\$400,000 Revenues**
- **657 Local Jobs Supported**
- **\$76,400 Income Earned**
- **\$2,700 Visitor Spending**
- **25 Visitors**

**\* Aviation + Non Aviation + All Multiplier Effects**

**TABLE C17**  
**Summary of Economic Benefits: 2002**  
**Chino Airport – Aviation Only Activities**

	Revenues	Earnings	Employment
<b>On-Airport Activity</b>	<b>\$32,000,000</b>	<b>\$10,400,000</b>	<b>266</b>
<b>Air Visitors</b>	<b>1,000,000</b>	<b>400,000</b>	<b>24</b>
<i>Direct Benefits</i>	<i>33,000,000</i>	<i>10,800,000</i>	<i>290</i>
<b>Indirect Benefits</b>	<b>54,700,000</b>	<b>12,300,000</b>	<b>237</b>
<b>Total Benefits</b>	<b>\$87,000,000</b>	<b>\$23,100,000</b>	<b>527</b>
<b>Note: Revenues, earnings and employment reflect activity associated with 145,591 operations.</b>			

Including indirect or multiplier effects, total benefits to the service area are \$87.0 million in revenues, 527 jobs and earnings of \$23.1 million.

Chino Airport is the origin of thousands of general aviation trips per year. Corporate and other private aircraft are used to visit other parts of the nation and the globe, and to bring visitors, customers and employees to the Chino area. The estimated cost of chartering aircraft to serve the needs of these travelers was found to be more than \$40 million. In addition, the presence of the Chino Airport provides unmeasured benefits in the form of flexibility in travel not found through reliance on scheduled air carriers.

It is important for citizens and policy makers to be aware that there are unmeasured but qualitative benefits from aviation that represent significant social and economic

value created by airports for the regions which they serve. In addition to exerting a positive influence on economic development in general, aviation often reduces costs and increases efficiency in individual firms. Annual studies by the National Business Aviation Association show that those firms with business aircraft have sales 4 to 5 times larger than those that do not operate aircraft.

In 2000, the net income of aircraft operating companies was 6 times larger than non-operators. Two thirds of the *Fortune* 500 firms operate aircraft and 88 percent of the top100 have business aircraft (see National Business Aviation Association, *Fact Book*, 2002).

As aviation activity increases in the airport service area, the economic benefits of the airport to the regional economy can be expected to increase.

The short term planning horizon for the airport is associated with an increase in operations to an annual level of 153,900. Assuming commerce on the airport and in the community increases at the same pace, employment on the airport will rise to 281 workers and jobs related to air visitors will increase to 25 (Table C18).

Visitor spending will reach \$1.1 million (measured in 2002 dollars) and the revenue benefits due to the presence of the airport will exceed \$55 million, including all multiplier effects.

The intermediate term planning horizon is based on 166,100 operations (Table C19). Employment on the airport will rise to 303 jobs and the total employment impact on and off the airport after all multiplier effects are 517 jobs, with earnings rising to \$21.9 million. Revenues will increase to \$60.3

million (2002 dollars) in the intermediate term.

The long term is defined as an airport activity level of 209,400 operations per year. The long-term projections imply on-airport employment of 383 workers with earnings from on-airport jobs reaching \$14.9 million. Spending by air visitors will be \$1.5 million, with employment of 35 workers in visitor industries.

Accounting for all multiplier effects, jobs supported in the airport service area under the long-term assumptions total 653. Revenues will be \$76.0 million, and earnings will be \$27.7 million, measured in 2002 dollars (see table C20).

**TABLE C18**  
**Summary of Economic Benefits: Short Term**  
**Chino Airport – Aviation Only Activities**

	Revenues	Earnings	Employment
<b>On-Airport Activity</b>	<b>\$33,799,689</b>	<b>\$10,980,645</b>	<b>281</b>
<b>Air Visitors</b>	<b>1,107,855</b>	<b>421,743</b>	<b>25</b>
<i>Direct Benefits</i>	<i>34,907,544</i>	<i>11,402,388</i>	<i>306</i>
<b>Indirect Benefits</b>	<b>21,022,557</b>	<b>8,976,328</b>	<b>173</b>
<b>Total Benefits</b>	<b>\$59,930,101</b>	<b>\$30,378,715</b>	<b>479</b>

**Note: Revenues, earnings and employment for short-term forecast period reflect activity associated with 153,900 operations per year .**

**TABLE C19****Summary of Economic Benefits: Intermediate Term  
Chino Airport – Aviation Only Activities**

	<b>Revenues</b>	<b>Earnings</b>	<b>Employment</b>
<b>On-Airport Activity</b>	<b>\$36,476,624</b>	<b>\$11,850,312</b>	<b>303</b>
<b>Air Visitors</b>	<b>1,195,598</b>	<b>455,145</b>	<b>27</b>
<i>Direct Benefits</i>	<i>37,672,222</i>	<i>12,305,457</i>	<i>330</i>
<b>Indirect Benefits</b>	<b>22,687,543</b>	<b>9,687,253</b>	<b>187</b>
<b>Total Benefits</b>	<b>\$60,359,765</b>	<b>\$21,992,700</b>	<b>517</b>

**Note:** Revenues, earnings and employment for intermediate term forecast period reflect activity associated with 166,100 operations per year.

**TABLE C20****Summary of Economic Benefits: Long Term  
Chino Airport – Aviation Only Activities**

	<b>Revenues</b>	<b>Earnings</b>	<b>Employment</b>
<b>On-Airport Activity</b>	<b>\$45,982,433</b>	<b>\$14,938,503</b>	<b>383</b>
<b>Air Visitors</b>	<b>1,507,170</b>	<b>573,756</b>	<b>35</b>
<i>Direct Benefits</i>	<i>47,489,603</i>	<i>15,512,259</i>	<i>418</i>
<b>Indirect Benefits</b>	<b>28,599,917</b>	<b>12,211,751</b>	<b>235</b>
<b>Total Benefits</b>	<b>\$76,089,520</b>	<b>\$27,724,010</b>	<b>653</b>

**Note:** Revenues, earnings and employment for long term forecast period reflect activity associated with 206,300 operations per year.

## TAX IMPACTS

Because of the spending, jobs, and earnings created by the presence of Chino Airport, the facility is an important source of public revenues. As airport activity expands, tax revenues will continue to grow.

Estimated tax potential is set out in Table C21. The table shows the revenues for each tax category that could potentially be collected based on current average tax rates relative to output and personal income (earnings) for California and San Bernardino County.

The first column in Table C21 shows tax revenues associated with the current level of Chino Airport operations, excluding non-aviation and capital project associated activities. The total of 527 workers with jobs supported by the presence of the airport have earnings of \$23.1 million. Federal personal income taxes are estimated at \$2.213 million, the second largest component of federal taxes. The largest federal tax category is social security contributions of \$2.215 million. Corporate profits taxes on a revenue base of

\$87.1 million are estimated as \$697,000.

Overall, federal tax revenues collected due to economic activity associated with Chino Airport are estimated to be \$5.6 million (in 2002 dollars).

State and local tax revenues are shown in the lower portion of the table. State and local tax revenues sum to \$3.997 million for the current level of airport operations.

The largest single component is sales taxes of \$1.68 million (this figure includes combined estimates for both state and local sales taxes).

Property taxes are the second largest source of revenues, estimated as \$1.039 million.

Combined federal, state, and local taxes are \$9.6 million at the current level of operations and are projected to rise to \$10.1 million at the short term operations level of 153,900. The long-term level of 209,400 operations would bring tax revenues of \$8.1 million federal taxes and \$5.7 million state and local revenues for a total of \$13.8 million.



**TABLE C21**
**Tax Impacts From On and Off-Airport Economic Activity  
Chino Airport - Excluding Non-Aviation and Capital Projects**

<b>Federal Taxes</b>				
<b>Revenue Category</b>	<b>Current</b>	<b>Short Term</b>	<b>Intermediate Term</b>	<b>Long Term</b>
Corporate Profits Tax	\$697,000	\$737,000	\$796,000	\$1,003,000
Personal Income Tax	2,213,000	2,339,000	2,524,000	3,182,000
Social Security Taxes	2,215,000	2,341,000	2,527,000	3,185,000
All Other Federal Taxes	480,000	507,000	547,000	690,000
<b>Total Federal Taxes</b>	<b>\$5,605,000</b>	<b>\$5,924,000</b>	<b>\$6,394,000</b>	<b>\$8,060,000</b>
<b>State and Local Taxes</b>				
<b>Revenue Category</b>	<b>Current</b>	<b>Short Term</b>	<b>Intermediate Term</b>	<b>Long Term</b>
Corporate Profits Tax	\$158,000	\$167,000	\$180,000	\$227,000
Motor Vehicle Taxes	47,000	50,000	53,000	67,000
Property Taxes	1,039,000	1,098,000	1,185,000	1,495,000
Sales Taxes	1,680,000	1,775,000	1,916,000	2,416,000
Personal Income Tax	523,000	553,000	597,000	752,000
All Other State & Local Taxes	550,000	581,000	628,000	790,000
<b>Total State &amp; Local Taxes</b>	<b>\$3,997,000</b>	<b>\$4,224,000</b>	<b>\$4,559,000</b>	<b>\$5,747,000</b>
<b>TOTAL TAX REVENUES</b>	<b>\$9,602,000</b>	<b>\$10,149,000</b>	<b>\$10,953,000</b>	<b>\$13,807,000</b>

Notes: All figures are in 2002 dollars. Derived from average tax rates in California and San Bernardino County and federal sources. Current impact estimate based on economic activity associated with 145,591 operations. Short term operations = 153,900; intermediate term = 166,100; long term = 209,400.